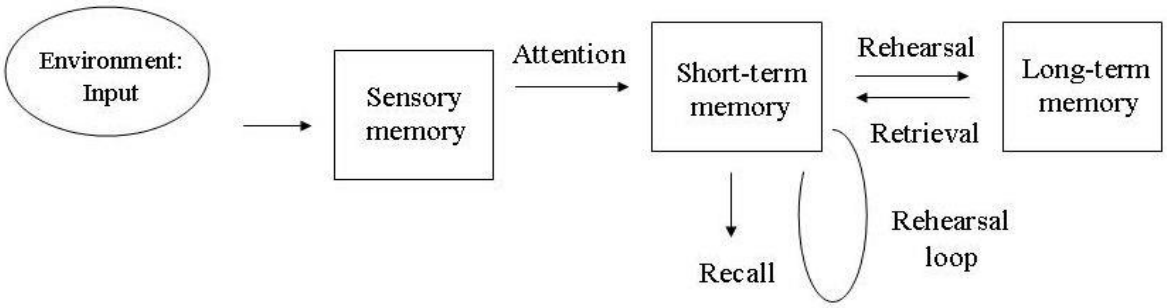
MODELS OF MEMORY

Multi Store Model of Memory

The multistore model of memory (also known as the modal model/stage model) was proposed by *Atkinson and Shiffrin* (1968) and is a structural model. They proposed that memory consisted of three stores: a sensory register, short-term memory (STM) and long-term memory (LTM). Information passes from store to store in a linear way, and has been described as an information processing model (like a computer) with an input, process and output.



www.aifer.in

Information is detected by the sense organs and enters the sensory memory. If attended to this information enters the short term memory. Information from the short-term memory is transferred to the long-term memory only if that information is rehearsed (i.e. repeated). If maintenance rehearsal (repetition) does not occur, then information is forgotten, and lost from short term memory through the processes of displacement or decay. Each store is a unitary structure and has its own characteristics in terms of encoding, capacity and duration.

Encoding is the way information is changed so that it can be stored in the memory. There are three main ways in which information can be encoded:

1. Visual (picture),
2. Acoustic (sound),
3. Semantic (meaning).

Capacity concerns how much information can be stored. Duration refers to the period of time information can last in the memory stores.

SHOUT
SHARE
IT

Sensory Memory

- Duration: ¼ to ½ second
- Capacity: all sensory experience (v. larger capacity)
- Encoding: sense specific (e.g. different stores for each sense)

Short Term Memory

- Duration: 0-30 seconds
- Duration: 0-30 seconds
- Encoding: mainly auditory

Long Term Memory

- Duration: Unlimited
- Capacity: Unlimited
- Encoding: Mainly Semantic (but can be visual and auditory)

WORKING MEMORY MODEL

www.aifer.in

It has now become apparent that both short-term and long-term memory are more complicated than previously thought. Working Model of Memory proposed by ***Baddeley and Hitch*** (1974) showed that short term memory is more than just one simple unitary store and comprises different components (e.g. central executive, Visuospatial etc.). Baddeley and Hitch (1974) argue that the picture of short-term memory (STM) provided by the Multi-Store Model is far too simple.

According to the Multi-Store Model STM holds limited amounts of information for short periods of time with relatively little processing. It is a unitary system. This means it is a single system (or store) without any subsystems. Working Memory is not a unitary store.

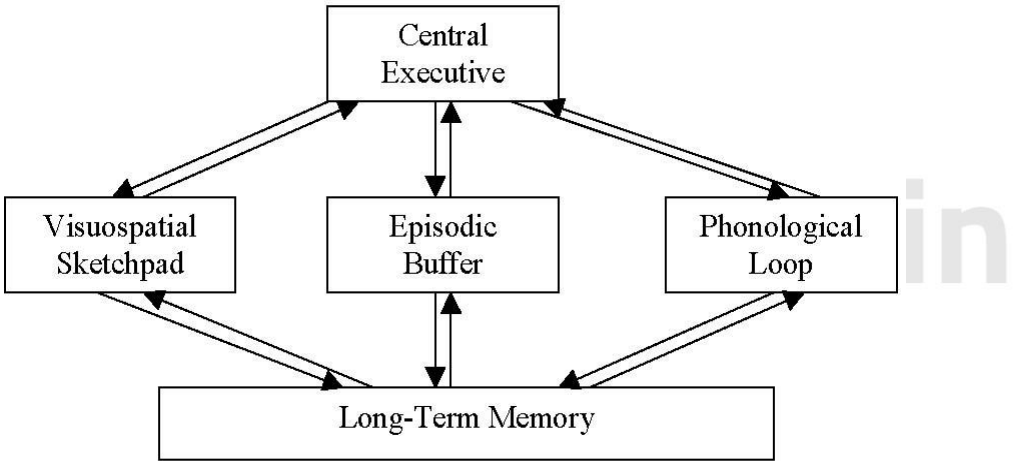
Working memory has replaced STM

Working memory is short-term memory However, instead of all information going into one single store, there are different systems for different types of information

CENTRAL EXECUTIVE

Drives the whole system (e.g., the boss of working memory) and allocates data to the subsystems: the phonological loop and the visuospatial sketchpad. It also deals with cognitive tasks such as mental arithmetic and problem-solving. The central executive decides which information is attended to and which parts of the working memory to send that information to be dealt with.

For example, two activities sometimes come into conflict, such as driving a car and talking. Rather than hitting a cyclist who is wobbling all over the road, it is preferable to stop talking and concentrate on driving. **The central executive directs attention and gives priority to particular activities.**



Baddeley suggests that the central executive acts more like a system which controls attentional processes rather than as a memory store.

This is unlike the phonological loop and the visuospatial sketchpad, which are specialized storage systems. The central executive enables the working memory system to selectively attend to some stimuli and ignore others.

- **Visuo-spatial Sketchpad (inner eye)**

  Stores and processes information in a visual or spatial form. The VSS is used for navigation. It is likely that the visuo spatial sketchpad plays an important role in helping us keep track of where we are in relation to other objects as we move through our environment (Baddeley, 1997).

- **Phonological Loop**

Part of working memory that deals with spoken and written material. It can be used to remember a phone number. It consists of two parts

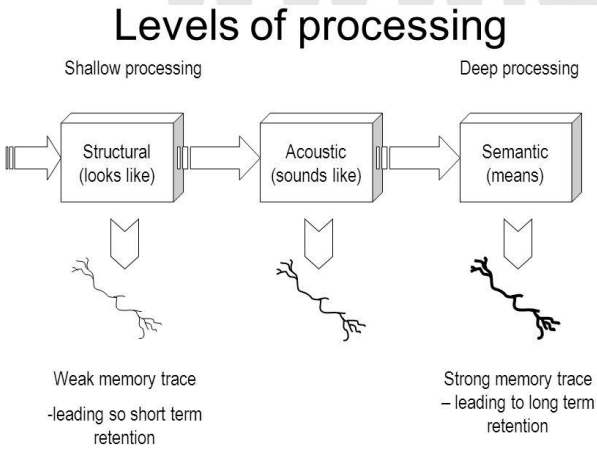
Phonological Store (*inner ear*) – Linked to speech perception. Holds information in a speech-based form (i.e., spoken words) for 1-2 seconds.

Articulatory control process (*inner voice*) – Linked to speech production. Used to rehearse and store verbal information from the phonological store.

Levels of Processing Model of Memory

The levels of processing model (**Craik and Lockhart**, 1972) focuses on the depth of processing involved in memory, and predicts the deeper information is processed, the longer a memory trace will last. Unlike the multi-store model it is a non-structured approach. The basic idea is that memory is really just what happens as a result of processing information. Memory is just a by-product of the depth of processing of information, and there is no clear distinction between short term and long term memory.

www.aifer.in



Craik and Lockhart propose that incoming information can be processed at different levels. For instance, they maintain that in dealing with verbal information, people engage in three progressively deeper levels of processing: structural, phonemic, and semantic encoding. Structural encoding is relatively shallow processing that emphasizes the physical structure of the stimulus. For example, if words are flashed on a screen, structural encoding registers such things as how the words are printed (capital, lowercase, and so on) or their length (how many

letters). Further analysis may result in phonemic encoding, which emphasizes what a word sounds like. Phonemic encoding involves naming or saying (perhaps silently) the words. Finally, semantic encoding emphasizes the meaning of verbal input; it involves thinking about the objects and actions the words represent. **Levels-of-processing theory proposes that deeper levels of processing result in longer-lasting memory codes.**

In one experimental test of levels-of-processing theory, Craik and Tulving (1975) compared the durability of structural, phonemic, and semantic encoding. They directed subjects' attention to particular aspects of briefly presented stimulus words by asking them questions about various characteristics of the words.

The questions were designed to engage the participants in different levels of processing. After responding to sixty words, the participants received an unexpected test of their memory for the words. As predicted, the subjects' recall was low after structural encoding, notably better after phonemic encoding, and highest after semantic encoding.

www.aifer.in

The hypothesis that deeper processing leads to enhanced memory has been replicated in many studies (Craik, 2002; Lockhart & Craik, 1990). Levels-of-processing theory has been enormously influential; it has shown that memory involves more than just storage and has inspired a great deal of research on how processing considerations affect memory (Roediger, Gallo, & Geraci, 2002).

UGC NTA NET PSYCHOLOGY
Aifer BEYOND PROMISES
For more helpful classes, study materials, mock tests:
9339 100 300
www.aifer.in education@aifer.in